

6-7 Quadratic Inequalities

Graph

ex1

$$y > x^2 + 4x + 1$$

$$V\left(-\frac{b}{2a}, \dots\right)$$

$$V(-2, -3)$$

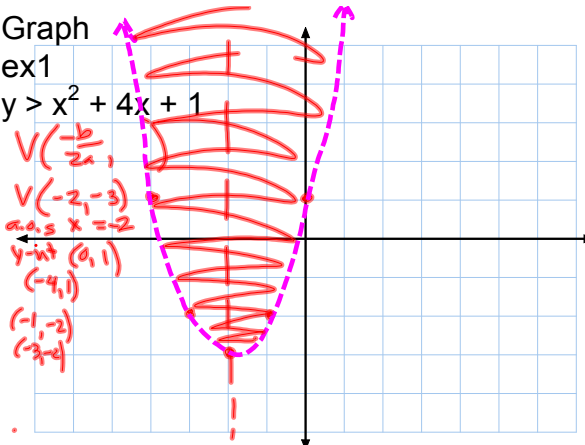
$$\text{a.o.s } x = -2$$

$$y\text{-int } (0, 1)$$

$$(-4, 1)$$

$$(-1, -2)$$

$$(-3, -4)$$



Graph

ex2

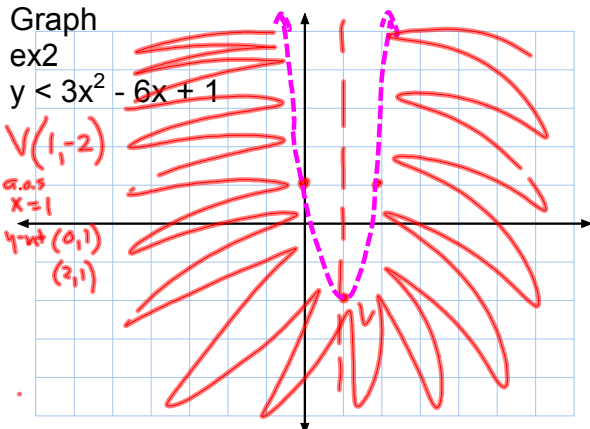
$$y < 3x^2 - 6x + 1$$

$$V(1, -2)$$

$$\text{a.o.s } x = 1$$

$$y\text{-int } (0, 1)$$

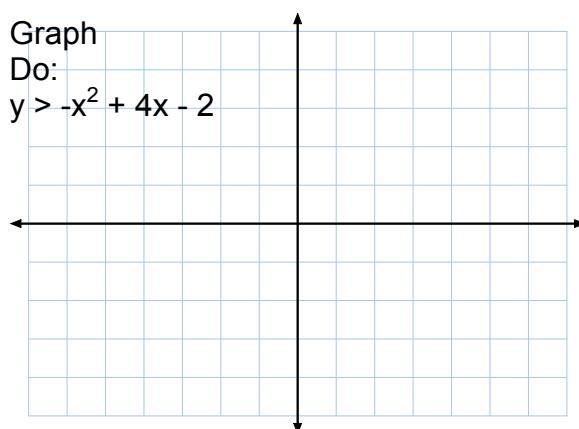
$$(2, 1)$$



Graph

Do:

$$y > -x^2 + 4x - 2$$



Solving Quadratic Inequalities

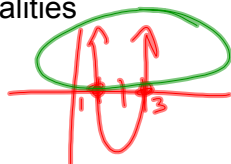
Ex 1

$$x^2 - 4x + 3 > 0$$

$$(x-1)(x-3) > 0$$

$$(-\infty, 1) \cup (3, +\infty)$$

$$\{x \mid x < 1 \text{ or } x > 3\}$$



Ex 2

$$0 \leq -4x^2 - 17x - 15$$

$$\begin{aligned} & -4x^2 - 12x - 5x - 15 \\ & -4x(x+3) - 5(x+3) \\ & (x+3)(-4x-5) \\ & \quad -3 \quad -\frac{5}{4} \end{aligned}$$

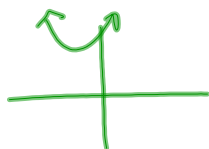
$$\left[-3, -\frac{5}{4}\right]$$

$$\{x \mid -3 \leq x \leq -\frac{5}{4}\}$$



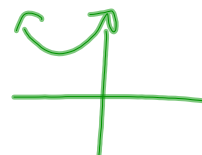
Ex 3

$$x^2 + 3x + 9 > 0$$

 \mathbb{R}


Ex 4

$$x^2 + 3x + 9 < 0$$

 \emptyset


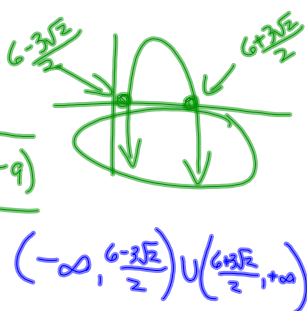
ex 5:

$$-2x^2 + 12x - 9 < 0$$

$$\frac{-12 \pm \sqrt{12^2 - 4(-2)(-9)}}{2(-2)}$$

$$\frac{-12 \pm \sqrt{72}}{-4}$$

$$\frac{-12 \pm 6\sqrt{2}}{-4} = \frac{6 \pm 3\sqrt{2}}{2}$$



In General:



p333-334

17, 19, 20, 31-41 odd, 42

(when solving, use a calc. to graph)